



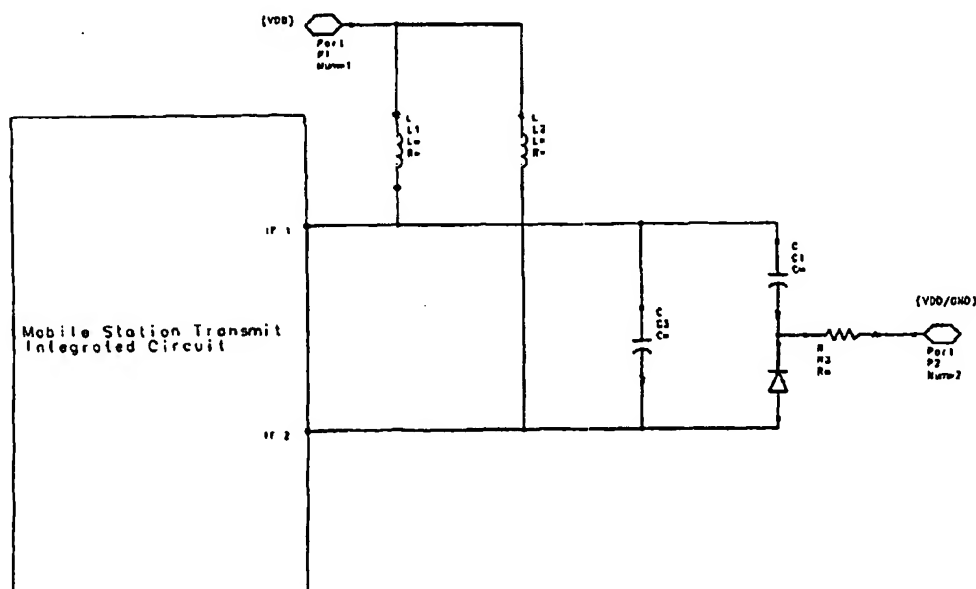
PCT

WO 2004/001996 A1

- Published:**
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2004/001996 A1



(57) Abstract: This invention is used within a Mobile Station (Cellular Phone). In particular it is part of the transmitter of the Mobile Station. This invention switches in the capacitor at low frequency in the Single Pole Band Pass filter. At high frequency the capacitor is switched out. Using this topology, a low loss Band Pass filter can be implemented for Mobile Station Transmit IC. This invention uses low component counts.

BAND SWITCHABLE INTERMEDIATE FREQUENCY BAND PASS FILTER

INVENTION DISCLOSURE FORM

The invention described herein evolved during the course of my (our) employment at QUALCOMM, and is being submitted pursuant to the terms of my (our) signed Employee Agreement(s).

Questions?

You may also try calling ext. 15886.

Remember: If you have electronic (soft) copies of documents describing your invention, you can save time by submitting them with this web page using the upload browser fields in Sections II and III.

Section I: General Information

A. TITLE OF THE INVENTION	
<div> <div>A method to switch between 2 Intern</div> <div>Frequency Band Pass filter with low</div> <div>for Mobile Station Transmit Interga</div> <div>Circuit.</div> </div>	EXAMPLE: A method and apparatus for processing RF signals using signal detection and noise cancellation techniques.
B. PURPOSE OF THE INVENTION	
<div> <div>This invention reduces the loss of</div> <div>the Band Pass filter switch using</div> <div>minimum components count.</div> </div>	Please explain the purpose, or intended utility, of your invention. EXAMPLE: The invention reduces the required signal to noise level, thereby increasing the capacity of a CDMA cellular telephone system.
C. PRIORITY	
What is the priority of your invention based on its importance to your project or the next anticipated public disclosure or use? Very High = filed within 2-3 months, High = within 6 months, Normal = within one year,	<div>Very High</div>

Flexible = no clear date when filing is necessary,
Evaluate = need to discuss further.

I feel the invention has significant ☐

☐ ☐

If you specified Very High or High priority, or you think there is information about your invention that will help us assess its priority, please explain it here.

EXAMPLE:

I feel the invention has significant value to QUALCOMM. After discussing it with others I am concerned that our competitors may be working on this same problem. Also, the planned release of the product in within the next six months.

D. EMAIL ADDRESS

Please input your QUALCOMM Email address. Do not include the '@qualcomm.com' portion of the address (i.e. the domain name).

You Must Include an Email Address for Your Disclosure to be Processed Properly.

EXAMPLE: kleing

Your Email Address:

asee

E. INVENTORS

Please input the name of each Inventor including yourself, along with the other information requested when available. Please include a middle initial with the name.

EXAMPLE:

Klein S. Gilhousen
kleing
658-1234
Q-358

Inventor 1 Info (Your Info):

Name: See, Puay Hoe

Email: asee

Tel Number: 619 651 7843

Bldg & Suite: V217H

Inventor 2 Info:

Name:

Email:

Tel Number:

Bldg & Suite:

Inventor 3 Info:

Name:

Email:

Tel Number:

Bldg & Suite:

Inventor 4 Info:	Name: <input style="width: 90%;" type="text"/> Email: <input style="width: 90%;" type="text"/> Tel Number: <input style="width: 90%;" type="text"/> Bldg & Suite: <input style="width: 90%;" type="text"/>
Inventor 5 Info:	Name: <input style="width: 90%;" type="text"/> Email: <input style="width: 90%;" type="text"/> Tel Number: <input style="width: 90%;" type="text"/> Bldg & Suite: <input style="width: 90%;" type="text"/>
Inventor 6 Info:	Name: <input style="width: 90%;" type="text"/> Email: <input style="width: 90%;" type="text"/> Tel Number: <input style="width: 90%;" type="text"/> Bldg & Suite: <input style="width: 90%;" type="text"/>
If there are more than six (6) inventors please type two inventors separated by a backslash (\) in a single inventor name field.	
F. PUBLIC DISCLOSURE OR OFFER FOR SALE OF THE INVENTION	
<div style="border: 1px solid black; height: 100px; width: 90%; margin: 10px auto;"></div>	Please describe any public use, public disclosure, or offer for sale of the invention or the system in which the invention is used. Please provide dates when possible. EXAMPLE: The invention has been used in the field for at least two months. We also plan to discuss the invention in an upcoming conference.
G. INVENTION AND CONCEPTION	
Please input the date, if any, associated with each event.	
Conception of the Invention:	EXAMPLE: 1/19/95 <input style="width: 100px;" type="text" value="7/23/99"/>
Reduction to Practice:	<input style="width: 100px;" type="text" value="7/28/99"/>
Construction of device started on:	<input style="width: 100px;" type="text" value="7/28/99"/>
Construction of device was completed on:	<input style="width: 100px;" type="text" value="7/28/99"/>
H. FUNDING	
Government or other contract? <input type="checkbox"/> NO <input type="checkbox"/> YES Project Name: <input style="width: 150px;" type="text"/> Acct Charged: <input style="width: 150px;" type="text"/>	Company funded? <input type="checkbox"/> YES <input type="checkbox"/> NO Project Name: <input style="width: 150px;" type="text"/> Acct Charged: <input style="width: 150px;" type="text"/>

Section II: Background Information**A. OPERATING ENVIRONMENT**

Please describe the system and subsystems in which the invention is expected to be used, as well as other potential systems which could benefit from the use of the invention.

EXAMPLE: The invention is used within a cellular base transceiver station. In particular it is part of the cell site modem. The invention could also be used in a satellite or point to point wireless system, and could be incorporated into a subscriber unit with some modifications.

A High Level Design (HLD) Document may be a useful reference.

This invention is use within a Mobile station (Cellular Phone) In particular it is part of the Transmitter of the Mobile Station.

If you have a document describing the system in which the invention is to be used you may submit a soft copy by typing the name and directory of the document or by selecting the document via your system browser.

System Description Document:

B. INFORMATION SOURCES

Please provide any sources of background information you think might be useful to the preparation of the application.

EXAMPLE: CSM technical manual - QUALCOMM document number 80-12345. Digital Communications: Fundamentals and Applications, Author Bernard Sklar.

Please attach any available background document using your system browser. If you have more than one document please attach below or send via e-mail.

Background Document:

C. BACKGROUND AND PRIOR ART

How was the task previously performed prior to your invention? Can you provide the name of such a system?

EXAMPLE: The reverse link signal was demodulated along with the noise created by the other reverse link signals. The previous version of the CSM operated in this manner.

Section III: Description of the Invention.

A. OPERATION	
<p>Please describe the normal operation of your invention in as detailed a manner as possible.</p>	<p>EXAMPLE:</p> <p>During operation a set of reverse link signals are received at the base transceiver station. Each signal is demodulated at the base station and a best estimate of the transmitted data is made. Using that best guess, an ideal waveform is generated for each reverse link signal, and that ideal wave form is subtracted from the incoming set of reverse link signals. The adjusted set of reverse link signals are processed, and a second estimate of the data being transmitted is made. This second estimate is more likely to be accurate than the first, and thus the performance of the system is improved.</p>
<p>This invention switches in the capacitor at low frequency in the Single Pole Band Pass filter. At high frequency the capacitor is switched out. Using this topology, A low loss Band Pass filter can be implemented for Mobile Station Transmit IC. This invention uses low component counts.</p>	
<p>Please attach any document further describing the invention.</p>	<p>Invention Description Document:</p>
B. STRUCTURE	
<p>Please include at least one drawing illustrating the structure of flow (i.e. flow diagram) of your invention.</p>	<p>You may attach a soft copy, or hotmail a hard copy to B. Edmonston (T-160G) in the patent department separately. Please include the title of your invention along with the drawings.</p>
<p>Drawing of Invention:</p> <p>Additional Drawing of Invention:</p> <p>Additional Drawing of Invention:</p>	
C. MISCELLANEOUS	

Please add any additional information or general comments that would be helpful in processing this, or future, disclosures. Also, feel free to list or describe any documents being sent to us in relation to this disclosure.

<div data-bbox="422 388 1088 445" data-label="Text"><p>A hard copy of the circuit diagram will be sent to you.</p></div>	<div data-bbox="1117 388 1153 420" data-label="Image"></div> <div data-bbox="1117 625 1153 657" data-label="Image"></div> <div data-bbox="1117 657 1153 688" data-label="Image"></div>
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End of Invention Disclosure Form.

Thank you for using QUALCOMM's Internal Invention Disclosure Page. You will be contacted shortly regarding your invention disclosure submission. Feel free to check on the status of your submission at any time. [Status](#)

A copy of your disclosure will be e-mailed to you. If you do not receive, please call 15886.

Submit Form

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CLAIMS

1. A tank circuit for switching a transmitter between two intermediate transmit
frequencies, comprising:
 - An inductance;
 - A first capacitance connected in parallel with said inductance;
 - A second capacitance connected in series with a switch;
 - said second capacitance and said switch connected in parallel with said
first capacitance;
 - means for operating said switch to switch said second capacitance in and
out of said tank circuit, thereby changing the reactance of the tank circuit
and the transmit frequency of said transmitter.
2. A dual band wireless communication device having a transmitter operative in at
least two different transmit frequency bands, comprising:
 - A switched capacitance tank circuit for switching said transmitter between
said two different transmit frequency bands, said tank circuit comprising;
 - An inductance;
 - A first capacitance connected in parallel with said inductance;
 - A second capacitance connected in series with a switch;
 - said second capacitance and said switch connected in parallel with
said first capacitance;
 - means for operating said switch to switch said second capacitance
in and out of said tank circuit, thereby changing the reactance of
the tank circuit and the transmit frequency of said transmitter.

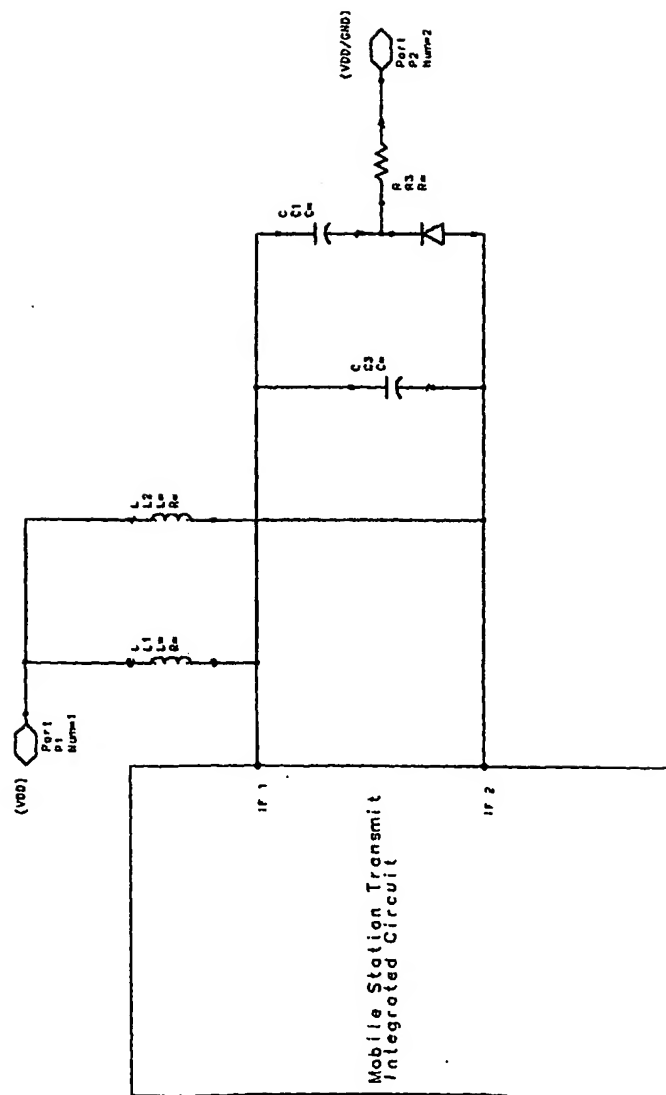


FIGURE 1 : Low Loss Switch IF Tank Design For Mobile Transmit IC

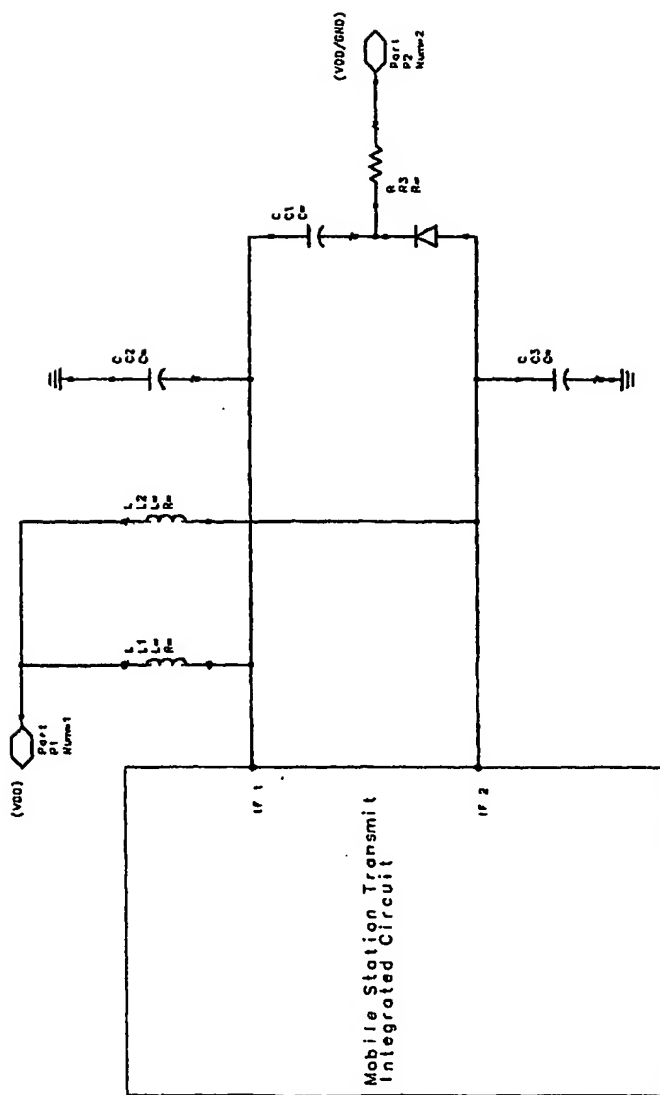


FIGURE 2 : Low Loss Switch IF Tank Design For Mobile Transmit IC

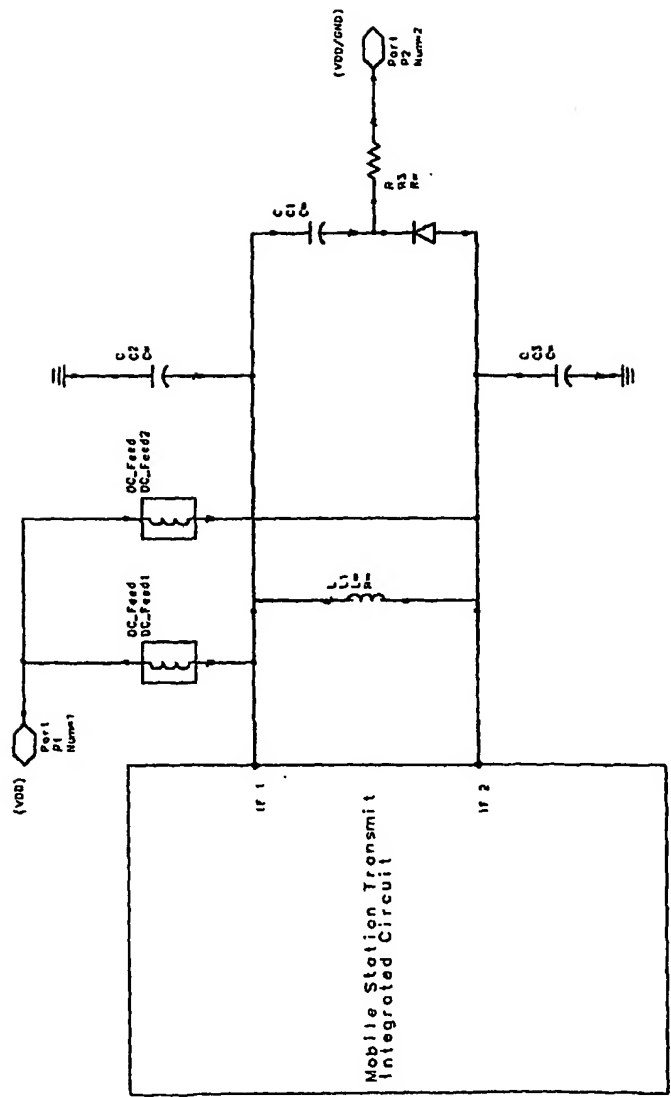


FIGURE 3 : Low Loss Switch IF Tank Design For Mobile Transmit IC

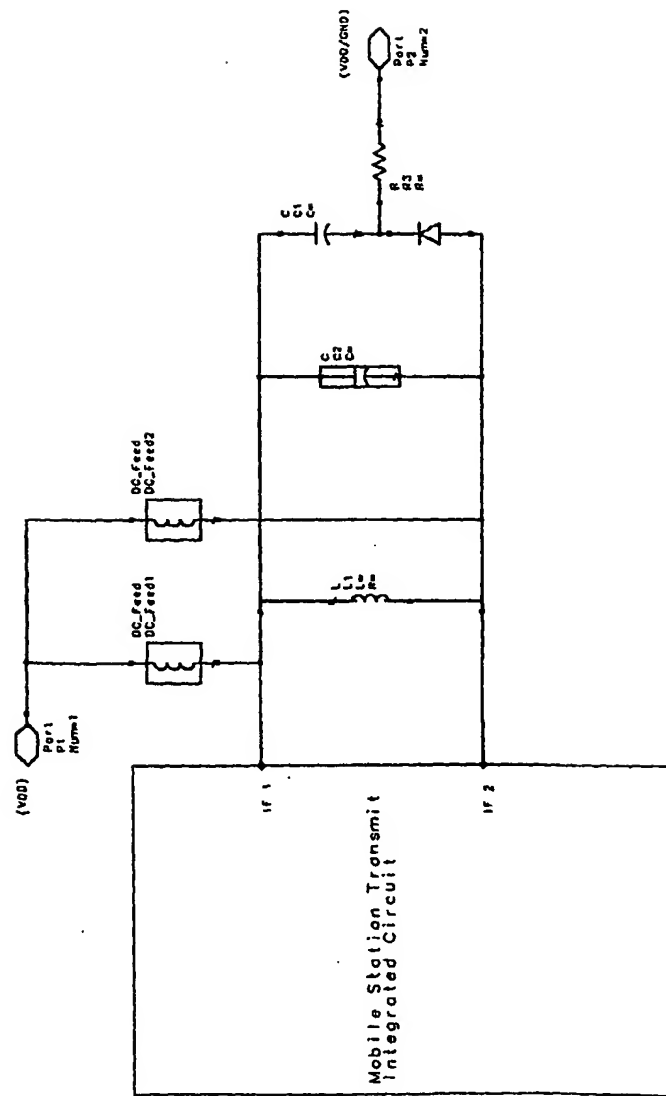


FIGURE 4 : Low Loss Switch IF Tank Design For Mobile Transmit IC

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/22162

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04B1/40 H03J5/24

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04B H03J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 996 599 A (ANDERSON WILLIAM D) 26 February 1991 (1991-02-26) the whole document ---	1,2
X	DE 40 28 572 A (TELEFUNKEN SENDESTECHNIK) 12 March 1992 (1992-03-12) the whole document ---	1
A		2
A	US 5 880 643 A (GAERDENFORS TORBJOERN ET AL) 9 March 1999 (1999-03-09) the whole document ---	1,2
X	US 4 186 360 A (OHASHI TADAMASA) 29 January 1980 (1980-01-29) abstract column 1, line 1 -column 2, line 25 figure 2 ---	1
A		2
	--- -/--	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

8 document member of the same patent family

Date of the actual completion of the international search

14 November 2000

Date of mailing of the international search report

24/11/2000

Name and mailing address of the ISA

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Authorized officer

Lindhardt, U

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/22162

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	EP 0 951 147 A (KONINKL PHILIPS ELECTRONICS NV)	1
A	20 October 1999 (1999-10-20) the whole document -----	2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/22162

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4996599 A	26-02-1991	JP 2301211 A JP 2553949 B KR 148016 B	13-12-1990 13-11-1996 15-09-1998
DE 4028572 A	12-03-1992	NONE	
US 5880643 A	09-03-1999	AU 1447899 A BR 9814969 A EP 1032970 A NO 20002264 A WO 9926335 A	07-06-1999 03-10-2000 06-09-2000 18-05-2000 27-05-1999
US 4186360 A	29-01-1980	JP 53102601 A JP 53107201 A	07-09-1978 19-09-1978
EP 0951147 A	20-10-1999	CN 1235416 A JP 2000004180 A	17-11-1999 07-01-2000